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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/898,850	07/03/2001	Gottfried Ungerboeck	13226US02	1485
23446	7590	11/01/2004	EXAMINER	
MCANDREWS HELD & MALLOY, LTD 500 WEST MADISON STREET SUITE 3400 CHICAGO, IL 60661			HA, DAC V	
			ART UNIT	PAPER NUMBER
			2634	

DATE MAILED: 11/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/898,850

Applicant(s)

UNGERBOECK ET AL.

Examiner

Dac V. Ha

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM  
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 03 July 2001.  
2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-24 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-24 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 2/2/02, 1/28/03.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☒ Other: IDS: 04/08/04.

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. **Claims 16-19** are rejected under 35 U.S.C. 102(e) as being anticipated by Lee (US 6,678,334).

**Regarding claim 16**, Lee discloses “a commtmication node having a shaper, the shaper generating channel symbols in a constellation that exhibits a shaping gain of greater than 1 dB” in Abstract; col. 2, lines 61-65.

**Regarding claim 17**, Lee implies the teaching of “whereby a shaping gain of approximately 1.35 dB is attained” in col. 2, lines 61-65.

**Regarding claim 18**, Lee discloses “whereby a shaping gain of approximately 1.5 dB is attained” in Abstract; col. 2, lines 61-65; col. 5, lines 8-11.

**Regarding claim 19**, Lee implies the teaching “wherein the commtmication node further oomprises a transmitter, and wherein the transmitter comprises the shaper” in col. 1, line 27.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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3. **Claims 20, 24** are rejected under 35 U.S.C. 102(b) as being anticipated by Tanaka et al. (US 5,140,417) (hereafter Tanaka).

**Regarding claim 20**, Tanaka discloses "a communication node that performs a Huffman decoding operation to generate channel symbols" in col. 3, lines 30-48; col. 11, lines 11-49.

**Regarding claim 24**, Tanaka further implies the teaching "wherein the communication node has a transmitter, and wherein the Huffman decoding operation is performed by the transmitter" in col. 1, lines 1-25.

4. **Claim 1** is rejected under 35 U.S.C. 102(b) as being anticipated by Balkanski et al. (US 5,253,078) (hereafter Balkanski).

**Regarding claim 1**, Balkanski discloses "accepting data from a source of user data; accumulating the data until a Huffman codeword is recognized; mapping the Huffman codeword into a channel symbol; applying the channel symbol to an input of a channel" in col. 5, line 38 to col.10, line 57.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. **Claims 21-23** are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka in view of Lee.

**Regarding claim 21**, Tanaka discloses all claimed subject matter in claim 21, as stated above, except for “wherein the Huffman decoding operation results in a constellation of symbols and associated symbol probabilities leading to a shaping gain greater than 1 dB”. Lee discloses method for achieving “shaping gain greater than 1 dB” in Abstract; col. 2, lines 61-65; col. 5, lines 8-11. Both Tanaka and Lee utilize vector-quantizing, therefore, it would have been obvious to incorporate teaching of achieving “shaping gain greater than 1 dB” taught by Lee into Tanaka to optimize signal coding.

**Regarding claim 22**, Lee implies the teaching of “whereby a shaping gain of approximately 1.35 dB is attained” in col. 2, lines 61-65.

**Regarding claim 23**, Lee discloses “whereby a shaping gain of approximately 1.5 dB is attained” in Abstract; col. 2, lines 61-65; col. 5, lines 8-11.

7. **Claims 2-12** are rejected under 35 U.S.C. 103(a) as being unpatentable over Balkanski.

**Regarding claims 2-12**, all these claimed subject matter would have been obvious to one skilled in the art as design specific.

8. **Claims 13-15** are rejected under 35 U.S.C. 103(a) as being unpatentable over Balkanski in view of Lee.

**Regarding claim 13**, Balkanski discloses all claimed subject matter in claim 13, as stated above, except for “wherein a symbol constellation with unequal symbol probabilities leads to a shaping gain of greater than 1 dB”. Lee discloses such claimed subject matter in Abstract; col. 2, lines 61-65; col. 5, lines 8-11. Therefore, it would

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have been obvious to incorporate teaching of achieving "shaping gain greater than 1 dB" taught by Lee into Balkanski to optimize signal coding.

**Regarding claim 14**, Lee implies the teaching of "whereby a shaping gain of approximately 1.35 dB is attained" in col. 2, lines 61-65.

**Regarding claim 15**, Lee discloses "whereby a shaping gain of approximately 1.5 dB is attained" in Abstract; col. 2, lines 61-65; col. 5, lines 8-11.

### ***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Laroia et al. (US 5,388,124) disclose Precoding Scheme For Transmitting Data Using Optimally-Shaped Constellations Over Intersymbols-Interference Channels.

Eyuboglu et al. (US 5,297,170) disclose Lattice And Trellis-Coded Quantization.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dac V. Ha whose telephone number is 571-273-3040. The examiner can normally be reached on 5/4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 571-272-3056. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

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For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Dac V. Ha', with a horizontal line drawn underneath the signature.

Dac V. Ha  
Examiner  
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